MISSISSIPPI STATE UNIVERSITY

INVITATION FOR BIDS
OFFICE OF PROCUREMENT & CONTRACTS

1. INSTRUCTIONS FOR BIDDERS

a. Sealed bids will be received in the Office of Procurement & Contracts, Mississippi State University, for the purchase of the items listed herein.

b. All bids must be received in the Office of Procurement & Contracts on or before the bid opening time and date listed herein. Delivery of bids must be during normal working hours, 8:00 a.m. to 5:00 p.m. CST, except on weekends and holidays when no delivery is possible.

c. Bidders shall submit their bids either electronically or in a sealed envelope.
   i. Sealed bids should include the bid number on the face of the envelope as well as the bidders' name and address. Bids should be mailed to: 245 Barr Avenue, 610 McArthur Hall, Mississippi State, MS 39762.
   ii. At this time we only accept non-ITS bids electronically. For electronic submission of bids, go to: https://portal.magic.ms.gov and use the RFX number on the next page as your reference number.

d. All questions regarding this bid should be directed to the Office of Procurement & Contracts at 662-325-2550.

2. TERMS AND CONDITIONS

a. All bids should be bid "FOB Destination"

b. Bidders must comply with all rules, regulations, and statutes relating to purchasing in the State of Mississippi, in addition to the requirements on this form. General Bid Terms and Conditions can be found here: https://www.procurement.msstate.edu/procurement/bids/Bid_General_Terms_May_2019_V2.pdf

c. Any contract resulting from this Invitation for Bid shall be in substantial compliance with Mississippi State University's Standard Contract Addendum: https://www.procurement.msstate.edu/contracts/standardaddendum.pdf

Bid Number/RFX Number: 22-54/RFX#3160004942
Opening Date: March 30, 2022 @2:00 p.m.
Description: 15KV Pad Mounted Switchgear and Box Pads (Material Only)

Vendor Name: _____

Vendor Address: _____

Telephone Number: _____

Days the Offer is Firm: _____

Authorized Signature: _____

Name: _____

Title: _____

See following pages for specifications and bid pricing form.

Specifications & Materialman's Proposal
For
Pad-Mounted Switchgear & Electrical Vault
(Material Only)
For Lakeview Drive 13 kV Electrical Relocation

February 22, 2022

Prepared for:

Mississippi State University
610 McArthur Hall
Mississippi State, Mississippi 39762

Prepared by:

Atwell & Gent, P.A.
309 University Drive
Starkville, Mississippi 39759

JEFFREY ATWELL
REGISTERED PROFESSIONAL
ENGINEER
14774
Jeffrey Atwell
STATE OF MISSISSIPPI
02/22/2022

Job No.: 601E3078

TABLE OF CONTENTS

INSTRUCTION TO BIDDERS

15 KV PAD-MOUNTED SWITCHGEAR & ELECTRICAL VAULT (MATERIAL ONLY)
FOR LAKEVIEW DRIVE 13 KV ELECTRICAL RELOCATION
MISSISSIPPI STATE UNIVERSITY
MISSISSIPPI STATE, MISSISSIPPI

Bids that are sent by mail shall be clearly marked "Bid Enclosed" or "Bid Envelope Enclosed" as appropriate. The sealed envelope containing the bid shall have the following information shown on the envelope:

BID ENCLOSED
ITEM: 15 KV PAD-MOUNTED SWITCHGEAR & ELECTRICAL VAULT (MATERIAL ONLY)
FOR LAKEVIEW DRIVE 13 KV ELECTRICAL RELOCATION
OWNER: MISSISSIPPI STATE UNIVERSITY
MISSISSIPPI STATE, MISSISSIPPI
BIDDER: BIDDER'S ADDRESS
BID DUE: REFER TO ADVERTISEMENT FOR BIDS

Bids that are sent by parcel delivery service or hand-delivered should be addressed to:

Mr. Don Buffum, Director
Office of Procurements & Contracts
Mississippi State University
Barr Avenue, 610 McArthur Hall
Mississippi State, Mississippi 39762

Bids that are sent by mail should be addressed to:

Mr. Don Buffum, Director
Office of Procurements & Contracts
Mississippi State University
P.O. Box 5307
Mississippi State, Mississippi 39762

The Engineer for this project is:

Atwell & Gent, P.A.
P.O. Box 2558
Starkville, Mississippi 39760-2558
Telephone (662) 324-5658

The Engineer will represent the Owner in all matters pertaining to this project, including but not limited to, answering technical questions of prospective bidders and recommendations of lowest and best bid, acceptance of shop drawings and similar documents, and approval of invoices prior to payment by the Owner.

Submit all questions about the specifications to the Engineer, in writing. Replies will be issued to all prospective Bidders of Record. Neither the Engineer nor the Owner will be responsible for oral clarifications.

Pad-mounted switchgear and electrical vault unit prices shall be FIRM for delivery to the Owner as specified herein or firm with commodity price modifiers. Bidder shall indicate whether the pad-mounted switchgear price and/or electrical vault price is firm or a firm price with commodity modifiers. If Bidder submits a bid with commodity modifiers, a complete description of the method of calculating the final price of the transformer shall accompany the bid.

Bidders shall complete all blank spaces on the Materialman's Proposal Form for each item of equipment being bid in accordance with these specifications and terms and conditions. Bidder should insert the unit price in the blank under the Unit Price heading and multiply this unit price by the number shown in the Number Required heading and enter the product of this multiplication in the blank under the heading Total Price for each bid item on the Materialman's Proposal Form. The bidder shall sum the Total Bid Price for each Bid Item and enter this sum in the Total Bid Price.

Bidder shall insert the delivery time in weeks after receipt of an order for each item of equipment bid in the blank provided on the Materialman's Proposal Form. Bidder shall also indicate equipment being bid by the manufacturer's name and catalog number in the blanks provided on the Proposal Form. Bidder shall indicate warranty term to be provided in the blanks on the Proposal Form.

Bidder shall complete the Materialman's Proposal Form bound in these Specifications and shall submit two copies to the OWNER at the time that the bids are due. Bidders taking exceptions to any part of the specifications, conditions, or payment terms specified herein shall show such exception on the Materialman's Proposal Form in the space provided. If exceptions are not shown on the Proposal Form, Bidder must supply equipment specified herein under the terms and conditions specified herein. Proposal forms shall remain bound in the Specifications. Proposals that are modified, excepted, or in any way changed from the proposal that the OWNER is requesting in this request for proposals may be rejected by the OWNER.

It is intent of the OWNER to award the bid for these 15 KV PAD-MOUNTED SWITCHGEAR & ELECTRICAL VAULT (MATERIAL ONLY) on an individual low basis to the bidder with lowest and best responsive bid for Bid Items #1, #2 and #3 respectively. It is not necessary to bid all bid items. Unusually long lead times may be cause for rejection of bid by OWNER.

PROPOSAL FORM

15 KV PAD-MOUNTED SWITCHGEAR & ELECTRICAL VAULT (MATERIAL ONLY)
FOR LAKEVIEW DRIVE 13 KV ELECTRICAL RELOCATION
MISSISSIPPI STATE UNIVERSITY
MISSISSIPPI STATE, MISSISSIPPI

To: Mr. Don Buffum, Director
Office of Procurements & Contracts
Mississippi State University
Barr Avenue, 610 McArthur Hall
Mississippi State, Mississippi 39762

The undersigned (hereinafter called the MATERIALMAN) acknowledges by his signature that he has received and examined the documents entitled "Specifications and Materialman's Proposal for 15 KV PAD-MOUNTED SWITCHGEAR & ELECTRICAL VAULT (MATERIAL ONLY) for Mississippi State University (hereinafter called the OWNER), dated February 21, 2022, and has included the provisions of the Specifications in his Proposal. The MATERIALMAN further acknowledges that he has received the following addenda:

Addendum No. _____ Dated _____

The Materialman hereby proposes to sell and deliver to OWNER, upon the terms and conditions herein stated, the equipment specified in the attached specification for the following sums:

Bid Item	Description	Unit Price	No. Req'd	Unit	Total Price
1	4-Way Pad-Mounted Switchgear	_____	1	EA	_____
2	5-Way Pad-Mounted Switchgear	_____	1	EA	_____
3	Precast Concrete Electrical Vault	_____	1	EA	_____

The above unit price for Bid Items #1 & #2 pad-mounted switchgear is (mark appropriate box):

☐ Firm for delivery as specified herein.

☐ Firm with commodity price modifiers.

The above unit price for Bid Item #3 electrical vault is (mark appropriate box):

☐ Firm for delivery as specified herein.

☐ Firm with commodity price modifiers.

NOTE: If price has commodity price modifiers, Bidder shall submit with his bid a complete description of the method that will be utilized to calculate the final price.

A. Bid prices, whether firm for delivery or firm subject to commodity price modifiers, shall be remain in effect if accepted by the OWNER within thirty (30) days and shall include delivery to OWNER, ready for OWNER's use.

B. The prices set forth herein do not include any sums which are or which may be payable by the MATERIALMAN on account of taxes imposed by any taxing authority upon the sale, purchase, or use of the equipment. If any such tax is applicable to the sale, purchase, or use of the equipment, the amount thereof shall be added to the purchase price and paid by the OWNER.

C. The items included in each of the above bid prices are as follows:

BID ITEM NO. 1

MANUFACTURER: _____

CATALOG NO.: _____

BID ITEM NO. 2

MANUFACTURER: _____

CATALOG NO.: _____

BID ITEM NO. 3

MANUFACTURER: _____

CATALOG NO.: _____

D. The warranty (in years) for each of the above bid items shall be as follows:

BID ITEM NO. 1: _____

BID ITEM NO. 2: _____

BID ITEM NO. 3: _____

E. The times of delivery shall be as follows:

BID ITEM NO. 1: _____

BID ITEM NO. 2: _____

BID ITEM NO. 3: _____

F. Title of the equipment shall pass to the Owner upon:

1. Delivery to location specified.
2. Satisfactory inspection for in-transit damage.
3. Acceptance by the Owner.

G. The MATERIALMAN shall include engineering data with his proposal as specified and as required to evaluate bid.

H. Bidder hereby certifies that he is:

( ) Manufacturer

( ) Manufacturer's Authorized Mississippi Representative

I. Exceptions: _____

_____

J. It is understood by the undersigned that the OWNER retains the privilege of accepting or rejecting all or any part of this proposal and to waive any informalities or technicalities therein. Counter-proposals or qualified bids shall be subject to rejection at the discretion of the OWNER.

It is also understood by the undersigned that the OWNER reserves the right to conduct investigations to evaluate the proposals received and to award the bid for this equipment to the lowest Bidder, who in the OWNER's evaluation will provide the equipment which will be in the best interest of the OWNER.

MATERIALMAN:

BY: _____

TITLE: _____

COMPANY: _____

ADDRESS: _____

_____

TELEPHONE NO.: _____

EMAIL: _____

DATE SIGNED: _____

SPECIFICATION FOR 15 KV PAD-MOUNTED SWITCHGEAR UNIT

1.1 SCOPE

A. Section Includes:

1. Bid Items
2. References.
3. Submittals.
4. Quality Assurance.
5. Critical Requirements.
6. Construction.

1.2 BID ITEMS

A. Bid Item #1: S&C Electric Vista "422" Pad Mounted Switchgear Unit or equal.

B. Bid Item #2: S&C Electric Vista "532" Pad Mounted Switchgear Unit or equal.

1.3 REFERENCES

A. American National Standards Institute (ANSI):

1. ANSI C37.72 - Manually Operated, Dead Front Padmounted Switchgear with Load Interrupting Switches and Separable Connectors for Alternating Current Systems.
2. ANSI C37.112 -IEEE Standard Inverse-Time Characteristic Equations for Overcurrent Relays.
3. ANSI C57.12.28 - Pad-Mounted Equipment - Enclosure Integrity.

B. Institute of Electrical and Electronics Engineers:

1. IEEE 386 - Standard for Separable Insulated Connector Systems for Power Distribution Systems above 600 V.

C. National Electrical Manufacturers Association:

1. NEMA 260 - Safety Labels for Pad Mounted Switchgear and Transformers Sited in Public Areas.

1.4 SUBMITTALS

A. Submit catalog data on all equipment items specified in this section to be utilized on this Project.

B. Sufficient information, clearly presented shall be included to determine compliance with Drawings and Specifications.

C. The specific item proposed and its area of application shall be marked on the catalog cuts.

D. Shop Drawings: Indicate electrical characteristics and connection requirements, outline dimensions, connection and support points, weight, specified ratings and materials.

E. Product Data: Submit electrical characteristics and connection requirements, standard model design tests, and options.

F. Test Reports: Indicate procedures and results for specified factory and field testing and inspection.

1.5 QUALITY ASSURANCE

A. Furnish manufacturer's standard one-year warranty on pad mounted switchgear.

B. Switchgear shall be manufactured within the United States of America.

1.6 CRITICAL REQUIREMENTS

A. Product Description:

1. Bid Item #1: ANSI C37.72 pad mounted switchgear, 15 kV, 600 ampere, SF6 insulated, deadfront construction, with two (2) switched ways and two (2) fault interrupter way, with switchgear cabinet, suitable for installation where accessible by general public.
2. Bid Item #2: ANSI C37.72 pad mounted switchgear, 15 kV, 600 ampere, SF6 insulated, deadfront construction, with three (3) switched ways and two (2) fault interrupter way, with switchgear cabinet, suitable for installation where accessible by general public.

B. Ratings:

1. System Voltage: 13.2 kV nominal, three phase, 60 Hz.
2. Maximum Design Voltage: 15.5 kV.
3. Insulation Type and Level: SF6 insulated, 95 kV BIL.
4. Main Bus and Switch Ampacity: 600 amperes, continuous.
5. Short Circuit Rating: 12,500 rms symmetrical amperes at rated nominal voltage.

C. Construction:

1. Single-sided Construction. All cable terminations shall be located on one side of the switchgear unit.
2. Cable Grounding: All ways, both load interrupter switch and fault interrupter, shall be three-position type (closed- open- ground).
3. Cabinet Height: Switchgear cabinet shall be low profile and in no case shall its overall height exceed 54".
4. Bushing Heights: 24" or higher. For switchgear with lower bushing heights, switchgear shall be furnished with hot-dip galvanized riser platform as required to provide 24" or higher bushing height.

D. Controls: Provide microprocessor-based overcurrent control for switchgear unit. Control shall incorporate ANSI C37.112 relay curves. Switchgear shall be capable of being programmed using a laptop computer. The control shall at a minimum feature the following time-current characteristic (TCC) curves:

1. Standard "E" speed curves.
2. Standard "K" speed curves.
3. IEEE C37.112-1996 "U" relay curves. Time dial settings shall be available in 0.1 increments from 0.0 to 10.0.

Controls provided shall be manufacturer's most advanced model available.

E. Potential Indication with Test Feature: Provide LCD display to indicate presence of voltage on each phase, and solar panel to supply power for testing of complete voltage-indication circuit and phasing circuit. One potential indicator shall be provided for each bus-terminal, load interrupter switch, and fault-interrupter way.

1.7 CONSTRUCTION

A. Switching:

1. Bid Item #1: Two (2) three-pole load interrupter switches and two (2) three-pole fault interrupter switch.
2. Bid Item #2: Three (3) three-pole load interrupter switches and two (2) three-pole fault interrupter switch.

B. Switchgear Tank: Welded stainless steel.

C. Pad Mount Enclosure: Steel, conforming to requirements of ANSI C37.72 and C57.12.28.

D. Finish Color: The exterior of the unit shall be painted Carboline F235 Dark Bronze (or as accepted).

E. Load Interrupter Switches:

1. Three-position (closed-open-ground) type. The load interrupter switches shall provide three-pole live switching of 600-ampere three phase circuits.
2. Load interrupter switches shall provide a visible gap when open.
3. Operating shafts shall be pad lockable in any position. The operating shaft shall be capable of being locked to prevent operation to the ground position.
4. The load interrupter switches shall be furnished with a manual handle to charge the switch operating mechanism or to actuate the operating mechanism. Operating mechanism shall be capable of providing quick-make, quick break operation in either switching direction. The operating mechanism shall be designed to prevent inadvertent operation from the closed position directly to the ground position and vice versa.
5. Load interrupter switch terminals shall be equipped with three single pole 600-ampere bushings designed to ANSI/IEEE 386 Standards to accept all standard 600-ampere insulated deadbreak elbows.

F. Fault Interrupter Switches:

1. Three-phase resettable fault interrupters shall be provided in the switchgear for live switching of tap circuits and for fault interruption of tap circuits. Fault interrupters shall be vacuum or arc spinning contact type.

2. The fault interrupters shall be operated by a spring operating mechanism that is recharged with a manually operated handle. The operating mechanism shall operate independently of the speed of the manual handle. Trip indicators shall be provided on the fault interrupters that indicate the contact position is open. This indicator shall be fully visible through viewing windows in the switchgear tank.

3. Fault interrupters shall provide three-pole fault interruption and three-pole load switching.

4. The fault interrupters shall be non-reclosing, manual reset devices. An electronic assembly shall sense load and fault current on each phase of the load tap circuits. The electronic control shall be powered from current transformers mounted inside of the SF6 insulated switchgear tank. No external power source shall be required for overcurrent protection.

5. Fault interrupter switch terminals shall be equipped with three single pole 200-ampere bushings designed to ANSI/IEEE 386 Standards to accept all standard 200-ampere insulated loadbreak elbows.

G. Grounding Lugs: Furnished with one ground pad installed on switchgear unit and one ground pad installed on pad mount enclosure. Ground pads shall be NEMA two-hole type.

H. Labeling: Furnish safety labels in accordance with NEMA 260.

I. Accessories:

1. Mounting Provisions for Fault Indicator: Provide mounting provisions for fault indicators installed on each phase of load interrupter switches. Provide viewing windows for fault LED indicating lights for each phase of all load interrupter switches (e.g. three (3) per load interrupter switch).

2. Potential Indication with Test Feature: Provide LCD display to indicate presence of voltage on each phase, and solar panel to supply power for testing of complete voltage-indication circuit and phasing circuit. One potential indicator shall be provided for each bus-terminal, load interrupter switch, and fault-interrupter way.

J. Controls: Provide standard microprocessor-based overcurrent control for switchgear unit. Control shall incorporate ANSI C37.112 relay curves. Switchgear shall be capable of being programmed using a laptop computer. The control shall at a minimum feature the following time-current characteristic (TCC) curves:

1. Standard "E" speed curves.
2. Standard "K" speed curves.
3. IEEE C37.112-1996 "U" relay curves. Time dial settings shall be available in 0.1 increments from 0.0 to 10.0.

Controls provided shall be manufacturer's most advanced model available. Switchgear shall be furnished with all required Windows-compatible software and programming cables,

adapters, and all other components required to field program control from standard laptop computer.

K. Demonstration and Field Training: Manufacturer shall include four hours of on-site training by a factory authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain medium-voltage switchgear units and controls.

SPECIFICATION FOR ELECTRICAL VAULT

1.1 SCOPE

A. Section Includes:

1. Bid Items
2. References.
3. Submittals.
4. Quality Assurance.
5. Precast Concrete Electrical Vault.

1.2 BID ITEMS

A. Bid Item #3: Precast Concrete Electrical Vault.

1.3 REFERENCES

A. American Association of State Highway and Transportation (AASHTO):

1. AASHTO M306 - Standard Specification for Drainage, Sewer, Utility, and Related Castings.

B. American Concrete Institute (ACI):

1. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.

C. ASTM International:

1. ASTM A536 - Standard Specification for Ductile Iron Castings.
2. ASTM C857 - Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
3. ASTM C858 - Standard Specification for Underground Precast Concrete Utility Structures.
4. ASTM C891 - Standard Practice for Installation of Underground Precast Concrete Utility Structures.
5. ASTM C1037 - Standard Practice for Inspection of Underground Precast Concrete Utility Structures.

D. Institute of Electrical and Electronics Engineers (IEEE):

1. IEEE C2 - National Electrical Safety Code.

1.4 SUBMITTALS

A. Submit catalog data on all equipment items specified in this section to be utilized on this Project.

B. Sufficient information, clearly presented shall be included to determine compliance with Drawings and Specifications.

C. The specific item proposed and its area of application shall be marked on the catalog cuts.

D. Shop Drawings: Indicate dimensions, connection and support points, weight, specified ratings and materials.

E. Product Data: Submit electrical characteristics and connection requirements, standard model design tests, and options.

F. Test Reports: Indicate procedures and results for specified factory and field testing and inspection.

1.5 QUALITY ASSURANCE

A. Conform to IEEE C2, NFPA 70, and NECA 605.

B. Design and Certification: All vaults shall be designed and certified to meet design requirements by a Professional Engineer registered in the State of Mississippi.

1.6 PRECAST ELECTRICAL VAULTS

A. Manufacturers: Oldcastle, Lee's Custom Precast; or as accepted.

B. Substitutions: Section 26 00 00.

C. Design Requirements: Design structures, risers, and vault lids for minimum loads in accordance with ASTM C857 and ASTM C890.

1. Live Load: Comply with heavy traffic loading, ASTM C856, AASHTO Load Designation HS-20.

2. Dead Loads: Actual weight of materials producing static load.

D. Product Description: Non-corrosive steel reinforced precast concrete vaults designed in accordance with ASTM C858, comprising modular, interlocking sections complete with accessories.

E. Quality Assurance: Electrical vaults shall be precast concrete manufactured in a plant especially designed for that purpose. Inspect vaults in accordance with ASTM C1037.

F. Shape: As indicated on Drawings.

G. Nominal Inside Dimensions: As indicated on Drawings or as accepted. Alternate interior dimensions will be considered where:

1. Alternate vault provides equivalent interior area (e.g. length times width) or greater.

H. Inside Depth: As indicated on Drawings.

I. Wall Thickness: 6" minimum or greater where required to meet Design Requirements.

J. Materials:

1. All cement shall conform to ASTM C150, Type I, IA, III, or IIIA. All fine and course aggregates shall conform to ASTM C33.

2. Steel reinforcing design shall conform to ASTM C857 Specifications for Structural Design for Underground Precast Concrete Utility Structures and shall be utilize Grade 60 bars conforming to the requirements of ASTM A615.

3. Batching, mixing and placing of concrete shall conform to ACI 304. Concrete shall develop a minimum compressive strength of 4,500 psi at twenty-eight (28) days.

4. Units shall consist of assembled sections. Assembled sections shall have mating edges with tongue and groove joints. Joints shall be designed to firmly interlock adjoining components, and provide waterproof junctions. Joints shall be sealed watertight using preformed plastic strip. Sealing material shall be installed in strict accordance with the sealant manufacturer's printed instructions. Apply two coats of vault manufacturer's standard asphalt or epoxy waterproofing material in compliance with the waterproofing manufacturer's recommendations. Coating shall completely cover all exterior surfaces of the vault.

5. Tolerances:

a. Vaults shall be designed and constructed so that the inside dimensions, as indicated on the Drawings, are maintained under the specified loading conditions.

b. Wall embedments shall be located within ¼ inch of the position as indicated on the Drawings.

K. Embedments: Embedments shall be galvanized steel or non-corrosive fiberglass or plastic. Embedments shall be designed to accept 1/2"-13 x 1-1/4" stainless steel bolts. Provide embedment's for support of cable junction point, cable supports, and grounding supports, as indicated on the Drawings.

L. Base Section: Include 3" deep x 12" round sump with cast sleeve, and two (2) 1" ground rod openings.

M. Top Section: Include vault cover and vault access doors.

N. Nameplate: Identified structure with manufacturer's name embedded in, or otherwise permanently attached to an interior wall face.

O. Duct Entry Provisions: Concrete knockouts shall be provided in each vault wall for conduit entry and exit. Concrete knockouts shall be designed to be easily removed by striking the center of the knockout with a hammer or similar means. The location and size of concrete knockouts in each wall of the vault is shown on detail drawing VLT-1. Concrete block outs (holes through the side of the vault) or conduit Term-A -Ducts will not be accepted.

P. Lifting Devices: Lifting devices shall be cast into vault base, riser extensions, and cover for use during unloading and installation operations. Lifting devices shall be designed and installed to allow unloading and lifting operations with either a 4-way chain or sling. Lifting devices in vault cover shall be furnished with cover plate.

Q. Cable Pulling Irons:

1. Manufacturers: Bowco Industries, or as accepted.
2. Substitutions: Section 26 00 00.
3. Product Description: Cable Pulling iron, 7/8-inch diameter, hot-dipped galvanized. Locate as shown on Drawings.

R. Cable Supports:

1. Manufacturers: Underground Devices "Saddle Rack", or as accepted.
2. Substitutions: Section 26 00 00.
3. Product Description: Heavy-duty nonmetallic type, length as required.

S. Sump Covers: ASTM A48/A48M, Class 30B gray cast iron.

T. Vault Cover and Access Doors

1. Design Requirements: Design vault cover and vault for minimum loads in accordance with ASTM C856, AASHTO Load Designation HS-20.
2. Vault Cover Description: The vault cover shall have opening sections above the switchgear to allow operation of the gear from grade level. The entire cover shall be removable for installation and removal of the switchgear, and installation and repair of the cables. Cover shall be constructed from non-corrosive steel reinforced concrete and shall be broom finished in a natural concrete gray color. The entire vault cover shall be removable by machine. The vault cover shall include hinged vault access doors for access to the operating mechanisms of the switchgear.
3. Vault Access Doors Description:
    a. Manufacturers: Halliday Type "H2W", or as accepted.
    b. Substitutions: Section 26 00 00.
    c. Description: Vault access doors shall be torsion spring assisted, have irregular/ rough surfaces, and be constructed of aluminum. Hinged or removable cover sections shall include locking devices to prevent access by unauthorized persons.
    d. Identification: Access door shall be identified "High-Voltage".

APPENDIX A
ELECTRICAL VAULT DETAIL DRAWING